



**TOGETHER**  
*for a sustainable future*

## OCCASION

This publication has been made available to the public on the occasion of the 50<sup>th</sup> anniversary of the United Nations Industrial Development Organisation.



**TOGETHER**  
*for a sustainable future*

## DISCLAIMER

This document has been produced without formal United Nations editing. The designations employed and the presentation of the material in this document do not imply the expression of any opinion whatsoever on the part of the Secretariat of the United Nations Industrial Development Organization (UNIDO) concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries, or its economic system or degree of development. Designations such as “developed”, “industrialized” and “developing” are intended for statistical convenience and do not necessarily express a judgment about the stage reached by a particular country or area in the development process. Mention of firm names or commercial products does not constitute an endorsement by UNIDO.

## FAIR USE POLICY

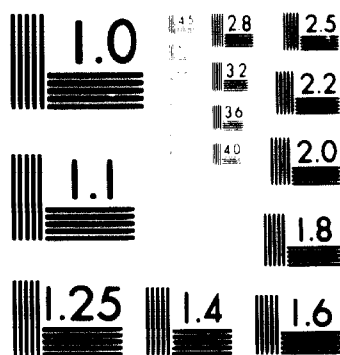
Any part of this publication may be quoted and referenced for educational and research purposes without additional permission from UNIDO. However, those who make use of quoting and referencing this publication are requested to follow the Fair Use Policy of giving due credit to UNIDO.

## CONTACT

Please contact [publications@unido.org](mailto:publications@unido.org) for further information concerning UNIDO publications.

For more information about UNIDO, please visit us at [www.unido.org](http://www.unido.org)

1 OF 1



MICROCOPY RESOLUTION TEST CHART  
NATIONAL BUREAU OF STANDARDS-1963-A

24x  
E

x



02122

ID/WG.259/17

United Nations Industrial Development Organization

Technical Seminar on Contracting Methods and  
Insurance Schemes for Fertilizer and Chemical  
Process Industries

Lahore, Pakistan, 25 - 29 November 1977

Peru.

TECHNICAL SEMINAR ON CONTRACTING METHODS AND INSURANCE  
SCHEMES FOR FERTILIZER AND CHEMICAL PROCESS INDUSTRIES

by

RIOS BERNINZON

002584

The views and opinions expressed in this paper are those of the author and do not necessarily reflect the views of the secretariat of UNIDO. This document has been reproduced without formal editing.

ID/WG.259/17

## INTRODUCTION

Peru is an economically underdeveloped country rich in raw materials, especially minerals, and like all the countries that form this group, strives to reach a greater degree of industrialization. This is expected to be achieved through the Regional Andean Pact formed by five south american countries, Bolivia, Colombia, Ecuador, Peru and Venezuela, with similar aims as regards to the European Common Market.

The Regional Andean Pact has assigned each of its members the development of specific industrial programs in order to satisfy the needs of the countries' demands.

Peru, therefore, needs technical assistance at government level and/or private enterprise to enable contracting in the best of terms, equipment and/or services to attend the development of the above mentioned programmes.

It is in this sense that I believe the topics discussed in this Conference might be of great services to achieve these ends.

SPECIAL CASES

A. Contracts for the Purchasing of equipment

I am General Manager of a Plant (Fertilizantes Sinteticos S.A.) manufacturers of fertilizers. The factory is situated in Lima, peru. Due to years of usage the plant's equipment must be renewed. Also we have in mind a program of expanding and diversifying the production. However, we have encounter problems due to failure in the contracting of equipment. These have not been made out to cover us from defects resulting in the purchased equipment. Therefore, we would like to point out the necessity of finding a proper solution to this problem. I will give an example:

CONTRACTING STEEL TUBES

5. Corrosion of condenser tubes of the Power Plant

1. Fertisa's ammonia and fertilizer plant, at Callao owns a power plant consisting of a steam boiler (40 tons- super heated steam per hour) a steam turbine and an alternative (7500 Kw. 5000 volts 3600 RPM). The turbine condenser is cooled by sea water taken by pumps from the sea. The plant is situated at the seeshore. This sea water is polluted by a nearby city sewer and also by the river discharge. After pumped it is filtered and sedimented and a pump sends it to the condenser. From there its runs off by gravity back to the sea. When the plant started in 1959 the condenser tubes were 70% copper and 30% nickel. They corroded severely in a short time by the action of sulphobacterias contained in the polluted sea waters. In 1960 these tubes ere exchanged for a complete set of stainless steel tubes, - type AISI 316 of Italian manufacture and a chlorine Injection system was installed.

2. These tubes lasted for fourteen years without trouble but when some tubes began to show slight corrosion in the inner surface we concluded that they had reached their life limit and we looked for a supplier to get a new set of the same tubes and quality type AISI 316. The new set, manufactured by a well known firm, was installed in the condenser in June 1976. After two months of operations we experienced the first leaks in the condenser which we attributed to defective expansion of some tubes in the corresponding sheet holes, but when we had the opportunity to inspect the condenser we detected 132 leaking tubes and the tubes removed showed many pits scattered over the inner surface, some of them extending throughout the entire thickness of the tube. Since that date, we had to stop some sections of the plant in order to detect further leaks and plug the respective tubes. After 10 months the plugging of the tubes had reached such an extent that it was imperative to change all of them.

3. The metallographic analysis performed to the samples of Japanese steel tubes by local and American laboratories showed its inner surface badly attacked by intergranular corrosion, condition being related to a defective heat treatment of the material during manufacture. However, the supplier stated that all their records showed that the tubes were produced and properly heat treated in accordance with given specifications.

As a result of this problem we suffered a loss of half million dollars due to equipment reposition, production stoppages, etc., and we had no other choice but to take legal action against the above mentioned supplier.

CONSIDERATIONS

This case shows that the contracting of equipment, even the simplest ones, could result in serious troubles. In the present case the routine chemical analysis were not enough, more sophisticated controls, like the metallographic analysis, were needed to guarantee that the quality of the material corresponds to the specifications ordered.

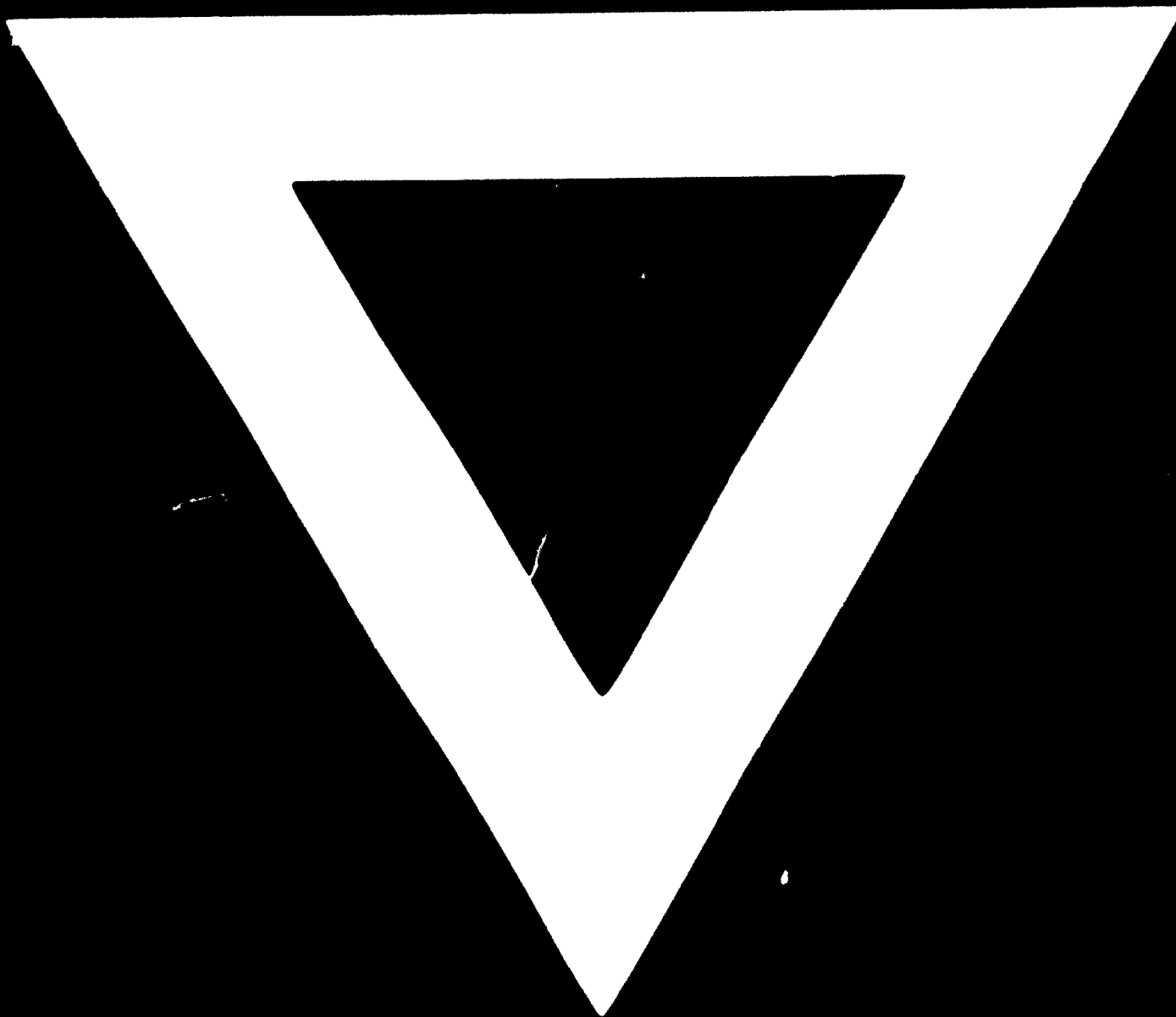
A new set of tubes was acquired by Fertisa. They have recently been installed after undergoing very careful controls. We hope we will not have any more problems.

CONCLUSIONS

In our country there is no organization either government or private with the proper knowledge to make a correct contract for purchasing equipment. This also applies for a precise insurance coverage. We believe, therefore, that it would be of great help if United Nations creates a program of courses by experts in this field. It would enable companies in the industrial area to be well prepared to effect these transactions with efficiency.



**B-823**



**82.06.23**